

9.—THE SEEDS OF *STRYCHNOS LUCIDA*, R.Br., AND THEIR ALKALOID CONTENT.

By E. M. WATSON.

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Strychnos lucida, R. Br., which is the only representative of the genus recorded in Western Australia, is recorded by Gardner (1) as being common in Central Kimberley. The author is indebted to Rev. J. R. B. Love, formerly of Kummurya Mission, for collecting the fruits used in this investigation.

It is an erect shrub, 6 to 15 feet in height. It bears orange-yellow fruits which are globular or ovoid-globular in shape, up to about 25 mms. in diameter and containing one or more seeds. Those available for this work were 12 to 15 mms. in diameter and were single seeded. The pericarp is brittle, hard and polished and is very slightly wrinkled and pitted; it is about 0.5 mm. thick and is easily cracked. The pulp, which is milky-white in fresh fruits, dries to a dark tacky semi-solid which adheres to the seed. It is readily removed by soaking the seeds in cold water and then rubbing between the fingers. The pulp has an intensely bitter taste and colour tests indicate that it contains an appreciable amount of brucine and a much smaller amount of strychnine.

The seeds are typically grey or greenish-grey in colour, disc or button-shaped, 10 to 13 mms. in diameter and about 3 mms. thick. They are generally flat and regular in shape but are occasionally irregularly bent or oval in shape. The edge of the seed is rounded (or very occasionally acute) and shows a distinct raised micropyle which is often connected by a ridge to the hilum. The testa is covered with radially arranged, closely adpressed, silky, lignified hairs. The endosperm, which makes up practically the whole of the seed, is horny and translucent, and is yellow, greenish-yellow or greyish-yellow in colour. It consists of large thick walled cells and, when sectioned and treated with nitric acid, shows the characteristic red colour given by brucine. When similarly treated with sodium vanadate in sulphuric acid solution, it gives the violet colour characteristic of strychnine. The intensity of this colour is appreciably less than that given by the seeds of *Strychnos nux vomica*, indicating a lower strychnine content, a fact borne out by subsequent analysis. The embryo is small and consists of two cordate, leaf-like cotyledons about 3 mms. long, with a cylindrical radicle about 2 mms. long, directed towards the micropyle. The seeds are odourless when dry and have an intensely bitter taste.

Macroscopically the seeds differ from those of *S. nux vomica* in size only, whilst microscopically no obvious differences are apparent.

On analysis, the seeds showed a strychnine content of 0.84 per cent. and a brucine content of 1.55 per cent. The former figure is much lower than the average strychnine content of *nux vomica* seeds (1.23 per cent.) or of St. Ignatius' beans (1.5 per cent.), so that commercial exploitation of *S. lucida* appears unlikely as long as *nux vomica* is available.

EXPERIMENTAL.

The method of estimation of the alkaloids was based on the methods of assay of *nux vomica* of the British Pharmacopoeia, 1932, and the United States Pharmacopoeia X.

The seeds were very finely shredded and the alkaloids completely extracted with alcohol-chloroform mixture (3:1) containing 6 per cent. of 10 per cent. ammonia solution. The solvent was removed from the extract, the alkaloids dissolved in chloroform containing a little alcohol, and the alkaloids extracted as their sulphates, the usual precautions being taken to avoid loss. The solution of the alkaloid sulphates was thoroughly washed with chloroform, the alkaloids then liberated with ammonia and extracted with chloroform. From this extract the solvent was removed, 5 ml. of alcohol added, again evaporated and the alkaloids dried at 100°C. for 30 mins. The total alkaloids were estimated by dissolving in 10 ml. of standard sulphuric acid solution and titrating the excess acid with standard sodium hydroxide solution, using methyl red as indicator.

The titration liquid was made alkaline with ammonia and the alkaloids again extracted with chloroform and recovered as before. The brucine was then oxidised with nitric acid in dilute sulphuric acid solution under the conditions of the British Pharmacopoeia, 1932, and the strychnine recovered and estimated volumetrically as before. The strychnine content, allowing the usual 2 per cent. loss associated with the method of estimation, was 0.84 per cent., and the difference between the strychnine and total alkaloids was equivalent to 1.55 per cent. of brucine.

REFERENCE.

- (1) Botanical Notes, Kimberley Division of Western Australia (Forests Dept. Bulletin No. 32).

Perth Technical College.
